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## United States Department of Agriculture,

OFFICE OF THE SECRETARY—Circular No. 28.

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### THE ADULTERATION AND MISBRANDING OF THE SEEDS OF ALFALFA, RED CLOVER, ORCHARD GRASS, AND KENTUCKY BLUEGRASS.

During the calendar year 1908 grass, clover, and alfalfa seeds were obtained in the open market in accordance with the following paragraph in the act of Congress making appropriations for the Department of Agriculture:

The Secretary of Agriculture is hereby directed to obtain in the open market samples of seeds of grass, clover, or alfalfa, test the same, and if any such seeds are found to be adulterated or misbranded, or any seeds of Canada bluegrass (*Poa compressa*) are obtained under any other name than Canada bluegrass or *Poa compressa*, to publish the results of the tests, together with the names of the persons by whom the seeds were offered for sale.

In carrying out the provisions of this act, 1,471 samples of seed were secured and analyzed, and publication is here made of the analyses of the 102 samples found to be adulterated or misbranded, together with the names of the seedsmen by whom they were offered for sale.

#### ALFALFA.

Of the 358 samples of alfalfa seed secured, 86 contained seed of sweet clover, 78 seed of yellow trefoil, and in 107 cases dodder was present in varying amounts from a trace to a sufficient quantity to sow 3,600 seeds per square rod when seeding at the rate of 16 pounds of alfalfa per acre. Only 8 lots of alfalfa seed were obtained which contained yellow trefoil seed in sufficient quantity to be considered an adulterant.

TABLE I.—Results of tests of samples of seed obtained in the open market as alfalfa seed and found to be adulterated.

| Seed offered for sale and sold as alfalfa by— |                                       | Sample obtained by— | Seeds and inert matter found upon analysis of sample. |                         |                        |                        |
|---|---------------------------------------|---------------------|---|-------------------------|------------------------|------------------------|
| Name of dealer.                               | Address.                              |                     | Alfalfa seed.   | Yellow trefoil seed.    | Other foreign seeds.   | Inert matter.          |
| Capelle Hardware Co...                        | Wilmington, Del.....                  | Mail.....           | <i>Per ct.</i><br>87.54                               | <i>Per ct.</i><br>10.14 | <i>Per ct.</i><br>0.12 | <i>Per ct.</i><br>2.20 |
| Do.....                                       | do.....                               | Purchase..          | 85.39   | 12.28                   | .11                    | 2.22                   |
| Grey & Co., Thomas J.                         | 32 South Market street, Boston, Mass. | Mail.....           | 88.79   | 7.83                    | 1.16                   | 2.22                   |
| Do.....                                       | do.....                               | Purchase..          | 90.25   | 7.19                    | .95                    | 1.61                   |
| Henderson Co., C. W...                        | Knoxville, Tenn.....                  | Mail.....           | 26.34   | 72.25                   | .30                    | 1.11                   |
| Do.....                                       | do.....                               | Purchase..          | 28.32   | 70.65                   | .30                    | .73                    |
| Wright, H.....                                | 306 Third street, Macon, Ga.....      | Mail.....           | 87.60   | 9.44                    | .08                    | 2.88                   |
| Do.....                                       | do.....                               | Purchase..          | 88.01   | 10.13                   | .15                    | 1.71                   |

### RED CLOVER.

Of the 413 samples of red clover seed secured, only 2 were adulterated with yellow trefoil seed. A trace of yellow trefoil seed was present in 164 samples, and dodder was found in 223 samples. Many samples contained large quantities of weed seeds. In seeding one lot at the rate of 8 pounds of red clover seed per acre 679 dodder seeds would be sown per square rod, and by the use of other lots more than 3,500 buckhorn and plantain seeds and 2,600 green foxtail seeds would be sown per square rod.

TABLE II.—Results of tests of samples of seed obtained in the open market as red clover seed and found to be adulterated.

| Seed offered for sale and sold as red clover by— |                                      | Sample obtained by— | Seeds and inert matter found upon analysis of sample. |                        |                        |                        |
|--|--------------------------------------|---------------------|---|------------------------|------------------------|------------------------|
| Name of dealer.                                  | Address.                             |                     | Red clover seed.                                      | Yellow trefoil seed.   | Other foreign seeds.   | Inert matter.          |
| Heiskell, jr., & Co., P. H.                      | 1301 K street NW., Washington, D. C. | Mail.....           | <i>Per ct.</i><br>90.28                               | <i>Per ct.</i><br>6.45 | <i>Per ct.</i><br>1.70 | <i>Per ct.</i><br>1.57 |
| Do.....  | do.....                              | Purchase..          | 61.50   | 28.57                  | 8.50                   | 1.43                   |

### ORCHARD GRASS.

Of the 343 samples obtained as orchard grass seed, 2 samples contained no orchard grass seed, 2 were orchard grass seed adulterated with chess, and 49 were orchard grass seed adulterated with seed of rye-grass or meadow fescue, or both.

TABLE III.—Results of tests of samples of seed obtained in the open market as orchard grass seed and found to be adulterated.

| Seed offered for sale and sold as orchard grass by— |  | Sample obtained by— | Seeds and inert matter found upon analysis of sample. |                             |                      |                |
|---|--|---------------------|---|-----------------------------|----------------------|----------------|
| Name of dealer.                                     | Address.                               |                     | Orchard grass.  | Meadow fescue and ryegrass. | Other foreign seeds. | Inert matter.  |
|   |  |                     | <i>Per ct.</i>  | <i>Per ct.</i>              | <i>Per ct.</i>       | <i>Per ct.</i> |
| Adams, T. Lee.....                                  | 417 Walnut street, Kansas City, Mo.    | Mail.....           | 49.64   | 36.76                       | 1.41                 | 12.19          |
| Do.....   | do.....                                | Purchase..          | 66.96   | 15.65                       | .40                  | 16.99          |
| Baird Co., C. R.....                                | 1357 Market street, Chattanooga, Tenn. | Mail.....           | 34.89   | 49.45                       | .89                  | 14.77          |
| Do.....   | do.....                                | Purchase..          | 65.43   | 10.66                       | 1.75                 | 22.16          |
| Barber & Bennett.....                               | Albany, N. Y.....                      | Mail.....           | 26.30   | 56.44                       | 2.61                 | 14.65          |
| Do.....   | do.....                                | Purchase..          | 32.32   | 48.41                       | 1.63                 | 17.64          |
| Bash & Co., S.....                                  | Fort Wayne, Ind.....                   | Mail.....           | 43.47   | 23.15                       | 7.65                 | 25.73          |
| Do.....   | do.....                                | Purchase..          | 36.50   | 26.36                       | 6.99                 | 30.15          |
| Brewster, Crittenden & Co.....                      | Rochester, N. Y.....                   | Mail.....           | 52.95   | 25.16                       | 2.31                 | 9.59           |
| Do.....   | do.....                                | Purchase..          | 46.29   | 30.57                       | 10.93                | 12.21          |
| Burt, William D.....                                | Dalton, N. Y.....                      | Mail.....           | 39.17   | 31.80                       | 5.08                 | 23.95          |
| Do.....   | do.....                                | Purchase..          | 42.15   | 29.65                       | 5.70                 | 22.50          |
| Chick, William F.....                               | 28 Sixth street, Bangor, Me.....       | Mail.....           | 36.67   | 39.41                       | 4.46                 | 19.46          |
| Do.....   | do.....                                | Purchase..          | 37.46   | 38.86                       | 2.29                 | 21.39          |
| Eden Nurseries.....                                 | Port Allegany, Pa.....                 | Mail.....           | 49.97   | 10.41                       | 9.35                 | 30.27          |
| Do.....   | do.....                                | Purchase..          | 48.85   | 9.06                        | 8.49                 | 33.60          |
| Emerson Co., Thomas W.....                          | 74 South Market street, Boston, Mass.  | Mail.....           | 45.91   | 28.52                       | 2.09                 | 23.48          |
| Do.....   | do.....                                | Purchase..          | 54.62   | 30.03                       | 1.34                 | 14.01          |
| Grant, M. S.....                                    | Leavenworth, Kans.....                 | Mail.....           | 38.06   | 12.70                       | 5.92                 | 43.32          |
| Do.....   | do.....                                | Purchase..          | 31.70   | 16.03                       | 6.23                 | 46.04          |
| Grey & Co., Thomas J.....                           | 32 South Market street, Boston, Mass.  | Mail.....           | 66.93   | 5.04                        | .91                  | 27.12          |
| Do.....   | do.....                                | Purchase..          | 62.88   | 11.06                       | 2.01                 | 24.05          |
| Hardin, Hamilton & Lewman.....                      | 218 Second street, Louisville Ky.....  | Mail.....           | 47.35   | .....                       | <sup>a</sup> 19.79   | 32.86          |
| Do.....   | do.....                                | Purchase..          | 48.11   | .....                       | <sup>b</sup> 23.37   | 28.52          |
| Helmer Milling Co.....                              | Fond du Lac, Wis.....                  | Mail.....           | 36.80   | 38.25                       | 1.81                 | 23.14          |
| Do.....   | do.....                                | Purchase..          | 40.57   | 37.41                       | 1.39                 | 20.63          |
| Holmes Seed Co.....                                 | Harrisburg, Pa.....                    | Mail.....           | 51.95   | 31.70                       | 2.54                 | 13.81          |
| Do.....   | do.....                                | Purchase..          | 56.92   | 25.94                       | 3.30                 | 13.84          |
| Hunkel's Seed Store.....                            | 327 Chestnut street, Milwaukee, Wis.   | Mail.....           | 23.23   | 61.15                       | .74                  | 14.88          |
| Do.....   | do.....                                | Purchase..          | 30.06   | 52.09                       | 1.70                 | 16.15          |
| Koss, Theo.....                                     | 396 Fifth street, Milwaukee, Wis.....  | Mail.....           | 38.23   | 39.86                       | 1.09                 | 20.82          |
| Do.....   | do.....                                | Purchase..          | 34.92   | 43.65                       | 1.20                 | 20.23          |
| Missouri Valley Seed Co.....                        | St. Joseph, Mo.....                    | Mail.....           | 63.73   | 19.66                       | 2.30                 | 14.31          |
| Do.....   | do.....                                | Purchase..          | 61.34   | 23.08                       | 2.19                 | 13.39          |
| Noble & Hoyt.....                                   | Fostoria, Ohio.....                    | Mail.....           | 48.55   | 25.32                       | 6.28                 | 19.85          |
| Do.....   | do.....                                | Purchase..          | 46.97   | 31.20                       | 5.22                 | 16.61          |
| Pioneer Seed Co., The.....                          | 1549 Wazee street, Denver, Colo.....   | do.....             | 55.10   | 23.11                       | 5.08                 | 16.71          |
| Reid & Co.....                                      | Oswego, N. Y.....                      | Mail.....           | 59.40   | 23.27                       | 1.18                 | 16.15          |
| Do.....   | do.....                                | Purchase..          | 57.06   | 27.88                       | 2.39                 | 12.67          |
| Sanders & Co., B. B.....                            | Albany, N. Y.....                      | Mail.....           | 43.13   | 27.14                       | 8.67                 | 21.06          |
| Do.....   | do.....                                | Purchase..          | 23.87   | 60.06                       | 3.15                 | 12.92          |
| Saul, Charles F.....                                | Syracuse, N. Y.....                    | Mail.....           | 29.17   | 54.39                       | 1.86                 | 14.58          |
| Do.....   | do.....                                | Purchase..          | 26.95   | 53.99                       | 1.05                 | 18.01          |
| Scobie & Parker Co.....                             | 507 Liberty street, Pittsburg, Pa..... | Mail.....           | 31.72   | 19.94                       | 9.71                 | 38.63          |
| Do.....   | do.....                                | Purchase..          | 34.07   | 23.71                       | 10.89                | 31.33          |
| Shepard Co., O. C.....                              | Medina, Ohio.....                      | Mail.....           | 29.17   | .....                       | <sup>c</sup> 47.22   | 23.61          |
| Do.....   | do.....                                | Purchase..          | 49.07   | 34.38                       | .73                  | 15.82          |
| Springfield Seed Co.....                            | Springfield, Mo.....                   | Mail.....           | 50.35   | 22.87                       | 9.72                 | 17.06          |
| Do.....   | do.....                                | Purchase..          | 67.85   | 11.83                       | 1.46                 | 18.86          |
| Whitney-Eckstein Seed Co.....                       | 599 Perry street, Buffalo, N. Y.....   | Mail.....           | 30.74   | 27.82                       | 4.73                 | 36.71          |
| Do.....   | do.....                                | Purchase..          | 32.25   | 29.29                       | 6.85                 | 31.61          |
| Yuess Gardens Co.....                               | Newburgh, N. Y.....                    | Mail.....           | .....   | 34.65                       | 2.88                 | 62.47          |
| Do.....   | do.....                                | Purchase..          | 1.20  | 13.28                       | 72.79                | 12.73          |

<sup>a</sup> Chess and smooth chess, 17.77 per cent.<sup>b</sup> Chess and smooth chess, 22.78 per cent.<sup>c</sup> Canada bluegrass, 21.50 per cent.



## KENTUCKY BLUEGRASS.

Of the 357 samples of Kentucky bluegrass seed obtained, 25 were found to contain Canada bluegrass as an adulterant, 12 were practically all Canada bluegrass, containing only a trace of Kentucky bluegrass seed, and 2 were meadow fescue misbranded and offered for sale under the name of Kentucky bluegrass seed.

TABLE IV.—Results of tests of samples of seed obtained in the open market as Kentucky bluegrass seed and found to be adulterated or misbranded.

| Seed offered for sale and sold as Kentucky bluegrass by— |  | Sample obtained by— | Seeds and inert matter found upon analysis of sample. |                   |                      |                |
|--|--|---------------------|---|-------------------|----------------------|----------------|
| Name of dealer.  | Address.                                   |                     | Kentucky bluegrass.                                   | Canada bluegrass. | Other foreign seeds. | Inert matter.  |
|  |  |                     | <i>Per ct.</i>  | <i>Per ct.</i>    | <i>Per ct.</i>       | <i>Per ct.</i> |
| Andrews, jr., Jim.....                                   | Columbia, Tenn.....                        | Mail.....           | 23.00   | 46.29             | 8.25                 | 22.46          |
| Do.....  | do.....                                    | Purchase..          | 16.80   | 58.20             | 7.12                 | 17.88          |
| Cassel & Son, F. P.....                                  | Lansdale, Pa.....                          | Mail.....           | .59   | 83.28             | 3.94                 | 12.19          |
| Do.....  | do.....                                    | Purchase..          | .59   | 83.56             | 3.73                 | 12.12          |
| Chick, William F.....                                    | 28 Sixth street, Bangor, Me.....           | Mail.....           | 7.73  | 70.39             | 1.63                 | 20.25          |
| Do.....  | do.....                                    | Purchase..          | 5.99  | 71.81             | .96                  | 21.24          |
| Drumm Seed & Floral Co.....                              | Fort Worth, Tex.....                       | Mail.....           | .17   | 86.12             | 1.59                 | 12.12          |
| Do.....  | do.....                                    | Purchase..          | .35   | 86.88             | 2.35                 | 10.42          |
| Farmers' Supply Co.....                                  | Roanoke, Va.....                           | Mail.....           | .40   | 79.50             | 7.25                 | 12.85          |
| Do.....  | do.....                                    | Purchase..          | .63   | 78.72             | 7.53                 | 13.12          |
| Hoermann, Frank.....                                     | Terre Haute, Ind.....                      | Mail.....           | 50.01   | 26.11             | 2.97                 | 20.91          |
| Do.....  | do.....                                    | Purchase..          | 41.66   | 33.54             | 3.52                 | 21.28          |
| Hunkel's Seed Store.....                                 | 327 Chestnut street, Milwaukee, Wis.....   | Mail.....           | 51.46   | 12.70             | 8.11                 | 27.73          |
| Do.....  | do.....                                    | Purchase..          | 54.94   | 10.54             | 6.55                 | 27.97          |
| Johnson & Son.....                                       | Goshen, Ind.....                           | Mail.....           | 38.04   | 34.01             | 1.47                 | 26.48          |
| Do.....  | do.....                                    | Purchase..          | 2.78  | 74.55             | 2.92                 | 19.75          |
| Jones & Isham.....                                       | Burlington, Vt.....                        | Mail.....           | 31.09   | 40.72             | 2.38                 | 25.81          |
| Do.....  | do.....                                    | Purchase..          | 27.73   | 42.84             | 2.25                 | 27.18          |
| Mace & Mansfield.....                                    | Greenville, Ohio.....                      | Mail.....           | .64   | 79.32             | 3.87                 | 16.17          |
| Do.....  | do.....                                    | Purchase..          | .52   | 73.74             | 4.62                 | 21.12          |
| Mingle & Co., P. B.....                                  | 103 Market street, Philadelphia, Pa.....   | Mail.....           | .09   | 85.96             | 2.85                 | 11.10          |
| Do.....  | do.....                                    | Purchase..          | .25   | 83.58             | 3.97                 | 12.20          |
| Montgomery, Ward & Co.....                               | Chicago, Ill.....                          | Mail.....           | 27.32   | 46.92             | 2.28                 | 23.48          |
| Do.....  | do.....                                    | Purchase..          | 26.45   | 46.21             | 2.43                 | 24.91          |
| Nashville Seed Co.....                                   | 215 Second avenue, Nashville, Tenn.....    | Mail.....           | 55.15   | 11.70             | 4.95                 | 28.20          |
| Do.....  | do.....                                    | Purchase..          | 56.19   | 11.10             | 5.88                 | 26.83          |
| Piper Bros.....  | Madison, Wis.....                          | Mail.....           | 50.80   | 12.38             | 7.95                 | 28.87          |
| Do.....  | do.....                                    | Purchase..          | 58.63   | 11.77             | 8.43                 | 21.17          |
| Ripps, J. F.....   | 528 Market street, San Antonio, Tex.....   | Mail.....           | .....   | .....             | <sup>a</sup> 95.55   | 4.45           |
| Do.....  | do.....                                    | Purchase..          | .....   | .....             | <sup>b</sup> 96.72   | 3.28           |
| Sprecher & Ganss.....                                    | Lancaster, Pa.....                         | Mail.....           | 51.58   | 9.90              | 5.99                 | 32.53          |
| Do.....  | do.....                                    | Purchase..          | 17.66   | 41.80             | 17.08                | 23.46          |
| Springfield Seed Co.....                                 | Springfield, Mo.....                       | Mail.....           | 61.01   | 12.41             | 1.75                 | 24.33          |
| Do.....  | do.....                                    | Purchase..          | 40.91   | 15.67             | 9.92                 | 33.50          |
| Stokes, Walter P.....                                    | 219 Market street, Philadelphia, Pa.....   | Mail.....           | .53   | 65.28             | 3.64                 | 30.55          |
| Do.....  | do.....                                    | Purchase..          | .41   | 80.81             | 3.83                 | 14.95          |
| Wisconsin Seed Co.....                                   | 102 West Water street, Milwaukee, Wis..... | do.....             | 25.66   | 51.33             | 1.86                 | 21.15          |
| Young & Sons Co., C.....                                 | 1406 Olive street, St. Louis Mo.....       | Mail.....           | 38.36   | 34.85             | 1.26                 | 25.53          |
| Do.....  | do.....                                    | Purchase..          | 23.90   | 51.97             | 1.22                 | 22.91          |

<sup>a</sup> Meadow fescue, 95.34 per cent.

<sup>b</sup> Meadow fescue, 96.55 per cent.

It is encouraging to note the falling off in the trade in adulterated seeds since the line of work reported upon in this publication was begun. The importation of yellow trefoil seed and its subsequent use as an adulterant of red clover and alfalfa seed has practically ceased, 214,000 pounds being imported in the three fiscal years 1905-1907, and only 10,000 pounds in the fiscal year 1908.

Only one-half as many lots of orchard grass seed were found to be adulterated in 1908 as were found in 1905, when the last collection of orchard grass seed was made.

In 1908 only 39 samples of Kentucky bluegrass seed were found to be adulterated or misbranded, as contrasted with 110 samples in 1907.

As has been previously stated in its publications, this Department, through the Seed Laboratory, will examine and report promptly as to the presence of adulterants and dodder in any samples of seed submitted for that purpose.

Respectfully submitted.

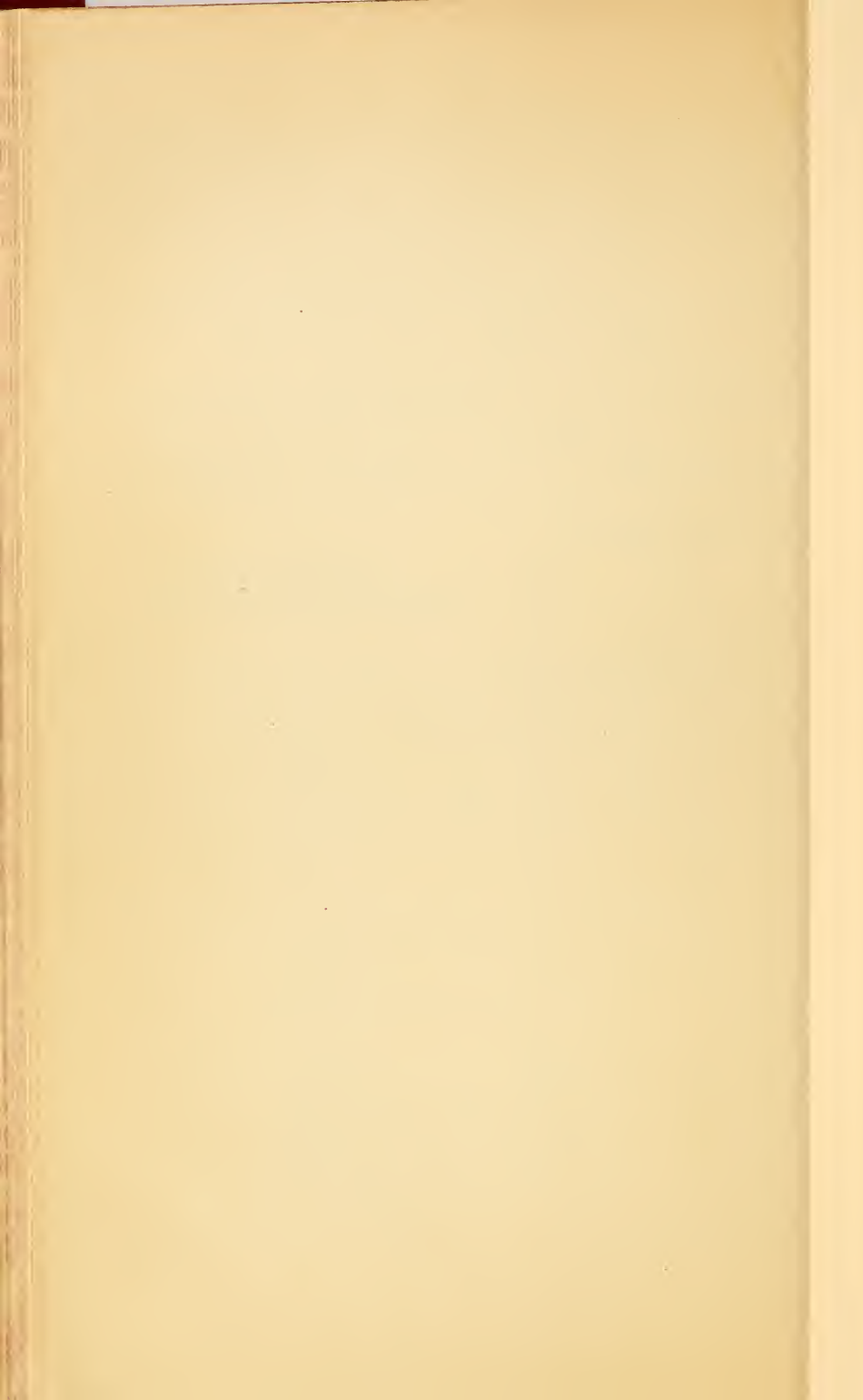
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Approved:

JAMES WILSON,  
*Secretary of Agriculture.*

WASHINGTON, D. C., *February 4, 1909.*

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